What is claimed is:

1. A method of depositing nanomaterials onto a substrate, comprising:

providing a plurality of nanostructures disposed upon a transfer substrate;

providing an adherent material deposited on one or more selected regions of a receiving substrate;

mating the transfer substrate with the receiving substrate, whereupon the nanostructures contact the nanostructures on the transfer substrate with the one or more selected regions of the receiving substrate; and

separating the transfer substrate from the receiving substrate to leave a population of nanostructures adhered to the one or more selected regions of the receiving substrate.

2. The method of claim 1, wherein the plurality of nanostructures comprises a plurality of nanofibers.

3. The method of claim 2, wherein the plurality of nanofibers comprises a plurality of semiconductor nanowires.

4. The method of claim 3, wherein the plurality of semiconductor nanowires comprise a semiconductor material selected from a Group II-VI semiconductor, a Group III-V semiconductor, or a Group IV semiconductor.

5. The method of claim 1, wherein the nanostructures are synthesized on the transfer substrate.

6. The method of claim 1, wherein the nanostructures are deposited upon the transfer substrate.

7. The method of claim 1, wherein the mating step comprises pressing the transfer substrate to the selected regions of the receiving substrate.

8. The method of claim 1, wherein the transfer substrate comprises a flexible planar sheet substrate.

9. The method of claim 8, wherein the transfer substrate is disposed on a roll.

10. The method of claim 9, wherein the roll of the transfer substrate is rolled over the receiving substrate.

11. The method of claim 1, wherein the receiving substrate comprises a flexible planar sheet substrate.

12. The method of claim 11, wherein the receiving substrate is disposed on a roll.

13. The method of claim 1, wherein between the mating step and the separating step, at least one of the transfer substrate and the receiving substrate are moved in a direction substantially parallel relative to the other of the transfer substrate and the receiving substrate, to substantially align the nanostructures adhered to the receiving substrate.

14. The method of claim 13, wherein at least 50% of nanostructures in the population of nanostructures adhered to the one or more selected regions of the receiving substrate are aligned to within less than 30° of a common axis.

15. The method of claim 13, wherein at least 50% of nanostructures in the population of nanostructures adhered to the receiving substrate are aligned to within less than 10° of a common axis.

16. The method of claim 13, wherein at least 50% of nanostructures in the population of nanostructures adhered to the receiving substrate are aligned to within less than 5° of a common axis.

17. The method of claim 13, wherein at least 80% of nanostructures in the population of nanostructures adhered to the one or more selected regions of the receiving substrate are aligned to within less than 30° of a common axis.

18. The method of claim 13, wherein at least 80% of nanostructures in the population of nanostructures adhered to the one or more selected regions of the receiving substrate are aligned to within less than 10° of a common axis.

19. The method of claim 13, wherein at least 90% of nanostructures in the population of nanostructures adhered to the one or more selected regions of the receiving substrate are aligned to within less than 30° of a common axis.

20. The method of claim 13, wherein at least 90% of nanostructures in the population of nanostructures adhered to the receiving substrate are aligned to within less than 10° of a common axis.

21. The method of claim 1, wherein following the separating step, the adherent material is removed from the surface of the receiving substrate.

22. The method of claim 21, wherein the removing step comprises plasma cleaning of the receiving substrate.

23. The method of claim 21, wherein the removing step comprises cleaning the surface of the receiving substrate with a solvent.

24. The method of claim 21, wherein the adherent material comprises a photoresist, and the removing step comprises exposing the adherent material to light and contacting the adherent material with a developer solution.

25. A method of depositing a plurality of substantially oriented nanostructures on a substrate, comprising:

providing a transfer substrate having a plurality of nanostructures deposited thereon, each of the plurality of nanostructures having a major axis;

providing a receiving substrate having a surface comprising an adherent material;

bringing the nanostructures on the surface of the transfer substrate into contact with the adherent material on the surface of the receiving substrate whereupon the nanostructures adhere to the adherent material;

moving one or more of the transfer substrate and receiving substrate relative to the other of the transfer substrate and the receiving substrate to substantially orient the nanostructures along a common axis; and

separating the nanostructures from the transfer substrate after the moving step, to leave the plurality of nanostructures substantially oriented on the receiving substrate along the common axis.

26. The method of claim 25, wherein a majority of the nanostructures are deposited on the transfer substrate with the major axis being substantially normal to a plane of the surface of the nanostructures on the transfer.

27. An article, comprising:

a substrate having a first surface;

a polymeric adherent material disposed on the first surface; and

a plurality of nanostructures each comprising a major axis, disposed on the first surface, and adhered to the adherent material, the plurality of nanostructures being substantially oriented along a common axis.

28. The article of claim 27, wherein at least 50% of the plurality of nanostructures are oriented to within 30° of the common axis.

29. The article of claim 27, wherein at least 50% of the plurality of nanostructures are oriented to within 10° of the common axis.

30. The article of claim 27, wherein at least 50% of the plurality of nanostructures are oriented to within 5° of the common axis.

31. The article of claim 27, wherein at least 60% of the plurality of nanostructures are oriented to within 30° of the common axis.

32. The article of claim 27, wherein at least 60% of the plurality of nanostructures are oriented to within 10° of the common axis.

33. The article of claim 27, wherein at least 60% of the plurality of nanostructures are oriented to within 5° of the common axis.

34. The article of claim 27, wherein at least 80% of the plurality of nanostructures are oriented to within 30° of the common axis.

35. The article of claim 27, wherein at least 80% of the plurality of nanostructures are oriented to within 10° of the common axis.

36. The article of claim 27, wherein at least 80% of the plurality of nanostructures are oriented to within 5° of the common axis.

37. The article of claim 27, wherein at least 90% of the plurality of nanostructures are oriented to within 30° of the common axis.

38. The article of claim 27, wherein at least 90% of the plurality of nanostructures are oriented to within 10° of the common axis.

39. The article of claim 27, wherein at least 90% of the plurality of nanostructures are oriented to within 5° of the common axis.

40. The article of claim 27, wherein the polymeric adherent material comprises a resist.

41. The article of claim 40, wherein the resist comprises a photoresist.

42. The article of claim 27, wherein the adherent material and the nanostructures adhered to the adherent material are disposed upon selected portions of the first surface.

43. A composition, comprising:

a layer of adherent material; and

a plurality of substantially aligned nanowires adhered to a surface of the adherent layer.

44. The composition of claim 43, wherein at least 50% of the plurality of nanostructures are oriented to within 30° of a common axis.

45. The composition of claim 43, wherein at least 50% of the plurality of nanostructures are oriented to within 10° of a common axis.

46. The article of claim 43, wherein at least 50% of the plurality of nanostructures are oriented to within 5° of a common axis.

47. The article of claim 43, wherein at least 60% of the plurality of nanostructures are oriented to within 30° of a common axis.

48. The article of claim 43, wherein at least 60% of the plurality of nanostructures are oriented to within 10° of a common axis.

49. The article of claim 43, wherein at least 60% of the plurality of nanostructures are oriented to within 5° of a common axis.

50. The article of claim 43, wherein at least 80% of the plurality of nanostructures are oriented to within 30° of a common axis.

51. The article of claim 43, wherein at least 80% of the plurality of nanostructures are oriented to within 10° of a common axis.

52. The article of claim 43, wherein at least 80% of the plurality of nanostructures are oriented to within 5° of a common axis.

53. The article of claim 43, wherein at least 90% of the plurality of nanostructures are oriented to within 30° of a common axis.

54. The article of claim 43, wherein at least 90% of the plurality of nanostructures are oriented to within 10° of a common axis.

55. The article of claim 43, wherein at least 90% of the plurality of nanostructures are oriented to within 5° of a common axis.

56. A system, comprising:

a transfer substrate having a plurality of nanostructures disposed upon a first surface thereof;

a receiving substrate comprising a first surface disposed opposed to the first surface of the transfer substrate; and,

an automatable translation system coupled to at least one of the transfer substrate and the receiving substrate, for bringing the first surface of the transfer substrate and the first surface of the receiving substrate into contact with each other, and subsequently separating the first surface of the transfer substrate from the first surface of the receiving substrate.

57. The system of claim 56, wherein the translation system comprises one or more rollers for directing a sheet of the transfer substrate into contact with a sheet of the receiving substrate.

58. The system of claim 56, further comprising an adherent material deposition system disposed over the first surface of the receiving substrate to deposit adherent material thereon, prior to the translation system moving the first surface of the transfer substrate into contact with the first surface of the receiving substrate.